

10/080771

PATENT  
HPDNO: 10010703-1

## SHARED BIT LINES IN STACKED MRAM ARRAYS

### Abstract of the Disclosure

5 A multi-layer random access memory device uses a shared conductive  
trace for writing to the MRAM memory cells. The MRAM has N (where N is  
greater than 1) stacked magnetic storage elements, where each of the N magnetic  
storage elements is operatively positioned between a different adjacent pair of  
N+1 stacked conductive traces. In one embodiment, the MRAM device includes  
10 a first conductive trace for generating a first magnetic field in response to a  
current applied to the first conductive trace, a second conductive trace for  
generating a second magnetic field in response to a current applied to the second  
conductive trace, and a third conductive trace for generating a third magnetic  
field in response to a current applied to the third conductive trace. A first  
15 magnetic storage element is operatively positioned between the first and second  
conductive traces and is adapted to store a bit of data as an orientation of  
magnetization and rotate its orientation of magnetization in response to the first  
and second magnetic fields generated by the first and second conductive traces.  
A second magnetic storage element is operatively positioned between the second  
and third conductive traces and is adapted to store a bit of data as an orientation  
20 of magnetization and rotate its orientation of magnetization in response to the  
second and third magnetic fields.

10080771.022202